

Your Worst Nightmare – Can’t Intubate, Can’t Ventilate!

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OBJECTIVES

The discussant/learners should be able to:

1. Utilize the ASA Practice Guidelines for management of the Difficult Airway
2. State the risk/benefits of the nonsurgical airway alternatives---laryngeal mask airway(LMA), intubating LMA, flexible fiberoptic intubation techniques and rigid fiberoptic scopes, transtracheal jet ventilation, and cricothyrotomy devices
3. Discuss the importance of developing and maintaining emergency ventilation and intubation skills so that a multiple option strategy is available to the clinician in the event of an airway crisis

STEM CASE - KEY QUESTIONS

An extremely anxious and tired 32-year-old Primigravida is scheduled for an urgent Caesarean Section for failure to progress. After several unsuccessful attempts at an epidural placement with virtually no patient cooperation, you decide to change anesthetic techniques and proceed with a general anesthetic.

The patient is 5 feet and 132 pounds with a Mallampati class II airway. After preoxygenation and a rapid sequence induction and laryngoscopy with a Macintosh #3 blade, you cannot visualize any part of the vocal cords and can see the epiglottis only with your assistant applying tracheal pressure. You attempt a blind oral intubation with a stylet. After ascertaining that the endotracheal tube is in the esophagus, you remove the tube, attempt mask ventilation, and ask your assistant to get additional anesthesia help.

You are struggling to establish a satisfactory airway.

What should you do next?

In retrospect, should other evaluation or strategies have been considered?

What do you tell the obstetrician that is scrubbed and awaiting your signal to commence the Caesarean section?

Can you describe this situation as a difficult intubation? Are there criteria to describe a difficult intubation situation?

Do you have equipment to deal with a difficult intubation? Should you?

Should you use your alternative intubation equipment in this situation?

You insert an oral pharyngeal airway and dislocate one temporo-mandibular joint but do not get a better airway, and most of the positive pressure ventilation appears to be going to the stomach. You try inserting a nasal trumpet, but the airway does not improve and there is now blood in the

airway. You have not been able to see a carbon dioxide curve on your capnograph with mask ventilation. You elect to attempt laryngoscopy with a Miller #3 after quickly adjusting the head to a better sniff position for suctioning of the airway under direct visualization and to assess the airway. You are able to suction 5-10 cc of bloody sputum but are unable to visualize the larynx. You desist with your laryngoscopy and resume your travail with mask ventilation, when the pulse oximeter alarms. Your patient is desaturating!

What should you do next?

In retrospect, should other evaluations or strategies have been considered?

What do you tell the obstetrician that is scrubbed and awaiting your signal to commence the Caesarean section?

Can you describe this situation as inability to ventilate? Are there criteria to describe an inability to ventilate situation?

You tell your obstetrician that this is a crisis and he should deliver the baby as rapidly as possible. You and your colleagues continue to try to establishing an adequate airway. Despite two-person mask ventilation with jaw thrust, the airway does not improve.

What should you do next?

What are the risk/benefits to the strategies and options you can elect?

What equipment would you like to have on hand? Do you have an institutional protocol for this situation? Should you?

In near desperation, you believe that you finally establish some sort of an airway after inserting a Combitube and inflating the proximal and distal cuffs. There appears to be some chest movement and an equivocal capnograph curve appears. The obstetricians manage to deliver a baby with good Apgar scores, and you hope that your ventilation will improve with the evacuation of the uterus. Unfortunately, the patient desaturates further, and you realize that your airway is unsatisfactory as the patient proceeds to cardiac arrest.

What should you do next?

What are the risk/benefits to the alternative strategies and options you can elect?

Is the Combitube the best device for this situation? What do you have available to you at your institution? Who determines the budget for anesthesia equipment?

What equipment would you have on hand? Do you have an institutional protocol for this situation? Should you? Is it important to have more than one method to improve your success at difficult intubations? How long should you persist in the difficult intubation situation? Do you, as an anesthesiologist, practice and maintain your difficult intubation skills? Should you?

PROBLEM BASED LEARNING DISCUSSION

- I. After failure to intubate and establish mask ventilation
 - A. Critical to establish the ability to ventilate via a face mask
 - 1. If mask ventilation not feasible, ventilation should be established by other means
 - 2. Concern about full stomach and risk of aspiration
 - 3. Maintenance of anesthesia and paralysis during mask ventilation
 - 4. “Two-person” mask ventilation
 - 5. Airway Evaluation for Intubation
 - 6. Mallampati-Samsoon Evaluation
 - 7. Predictive factors in evaluation of intubation
 - B. Alternative intubation equipment and strategies
 - C. Availability of emergency intubation cart with alternative intubation equipment
 - D. Risk/benefit analysis of GA vs. regional anesthesia for C-Section
 - E. Commencement of surgery without establishment of airway?
 - F. Definition of difficult intubation
 - 1. ASA practice guidelines definition
 - 2. Cormack and Lehane classification of laryngoscopy view
- II. Unable to establish mask ventilation and onset of desaturation
 - A. Significance of desaturation
 - 1. Risk to parturient
 - 2. Risk to fetus
 - 3. Commencement of C-section?
 - B. Definition of inability to ventilate
 - C. What is next on the ASA practice guideline of difficult airway management?
 - D. Is the ASA Guideline on Management of the Difficult Airway significant?
 - E. Assessment of ventilation with combitube
 - 1. Capnography
 - 2. Breath sounds
 - 3. Chest movement
 - 4. Pulse oximetry
 - 5. Blood gases
 - 6. Blood in surgical field
 - 7. Cardiovascular stability

With the more ubiquitous employment of laryngeal mask airways(LMAs) in anesthesia practice, the ghoulish specter of inability to ventilate has remarkably diminished. This is because more and more practitioners are now competent in LMA ventilation and have the skill to rescue the patient by providing LMA ventilation.

III. Risk/benefits of alternatives after failure to intubate and mask ventilate

- A. Transtracheal jet ventilation (TJV)
- B. Laryngeal Mask Airway (LMA)
- C. Combitube
- D. Intubating LMA
- E. Flexible Fiberoptic Intubation
- F. Fiberoptic Intubation Scopes
- G. Gum Elastic Bougie
- H. Cricothyroidotomy with IV catheter
- I. Cricothyrotomy devices
- J. Surgical Tracheostomy

IV. Methods for intubation in the difficult situation

- A. Traditional laryngoscopy methods
- B. Flexible fiberoptic laryngoscope
- C. Intubating LMA
- D. Other Fiberoptic scopes---Bullard, Wu, Usher, etc.
- E. Gum Elastic Bougie
- F. Strategy for employing more than one method
- G. When to desist

Anesthesiologists are currently making significant improvements in conquering the second poltergeist in our worst nightmare---Can't Intubate. An emerging principle is that anesthesiologists must practice and maintain their skills with several alternative intubation techniques in anticipation of encountering the crisis difficult intubation incident. Many recidencies are inaugurating difficult intubation curriculum. By advocating a multiple option strategy of difficult intubation techniques, it is felt that a successful intubation will be achieved before the risk/benefit ratio for further intubation attempts degenerates and the patient's surgery is postponed.

There is no single universal answer for an ideal strategy or sequence of intubation techniques for the difficult intubation challenge. Each practitioner brings to the situation individualized skills and experience in alternate intubation techniques. This is the time for each anesthesiologist to play to his/her strong suit. Furthermore, institutional constraints may limit the practitioner's choice of technique. Flexible fiberoptic laryngoscopes and rigid fiberoptic intubation scopes are marvelous devices, but useless if your department cannot afford them on the budget, or cannot afford the budget to repair and maintain them. Likewise, intubating LMAs cannot be relied upon to be available if the institution cannot keep them stocked. Thus, practitioners must develop their skills with the resources that are available in their practice. Anesthesiologists should be willing to join the priority debate with the bean counters at their institution. Investments in airway management resources will pay handsome returns in successful patient outcomes. Meanwhile, you need to develop a multiple method intubation strategy based on your strongest skills and available equipment.

V. Was this Cardiac Arrest Avoidable? Would there be a better outcome if this mother was treated by you tomorrow?

The stem case for this PBLD is based on an actual case which resulted in the tragic loss of the life of the mother. This PBLD is respectfully dedicated to her memory, so that we, clinicians, can continually learn from her to better serve our patients. This PBLD represents a classic anesthesia case and over the years the discussion has changed as new strategies, equipment, techniques and guidelines on airway management develop.

REFERENCES

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LEARNING SUMMARY

The discussant/learners should be able to:

1. Utilize the ASA practice guideline on management of the difficult airway
2. State the risk/benefits of the nonsurgical airway alternatives (laryngeal mask airway - LMA), intubating LMA, fiberoptic intubation techniques and scopes, transtracheal jet ventilation, and cricothyrotomy devices
3. Discuss the importance of developing and maintaining emergency ventilation and intubation skills so that a multiple option strategy is available to the clinician in the event of an airway crisis